INCH-POUND

MIL-PRF-1/825E
16 October 2008
SUPERSEDING
MIL-E-1/825D
14 January 1972

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING

TYPE 5651WA

The requirements for acquiring the electron tube described herein shall consist of this document and MIL-PRF-1.

Inactive for new design after 30 April 1997.

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

DESCRIPTION: Diode, miniature, voltage reference.

Outline --- 5-2 (EIA).

Base --- E7-1.

Envelope --- T5-1/2.

Cathode --- Glow discharge.

Base connections:

Pin No.	---	1	2	3	4	5	6	7
Element	---	a	k	Note 1	k	a	Note 1	k

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Total darkness ionization voltage	Ambient light ionization voltage	Operating voltage	Operating current	TE	TA	Alt
Unit:	V dc	V dc	V dc	mA dc	°C	°C	ft
Maximum:	---	---	90 (approx)	3.5	+155	+150	Note 2
Minimum:	115	115	82	1.5	---	-55	---
TEST CONDITIONS:	---	---	---	---	---	25±5	---

GENERAL:

Qualification – Not Required.

Reliable tube.

TABLE I. Testing and inspection.

MIL-STD-1311 Method	Requirement or test	Notes	Conditions	Acceptance level	Symbol	Limits		UNIT
						Min	Max	
	Conformance inspection, part 1							
3347	Ionization voltage (1)	---	Ebb/Ib = 1.5 to 3.5 mAdc; illumination = 5 to 50 ft candles	0.4	Ez	---	110	Vdc
3337	Voltage drop (1)	---	Ebb/Ib = 3.5 mAdc	0.4	Etd	82.0	88.0	Vdc
3337	Voltage drop (2)	---	Ebb/Ib = 1.5 mAdc	0.4	Etd	82.0	88.0	Vdc
3337	Voltage drop (3)	---	Ebb/Ib = 2.5 mAdc	0.4	Etd	83.5	86.5	Vdc
3335	Regulation	---	Etd(1) minus Etd(2)	0.4	Reg	---	±2.0	Vdc
3345	Voltage jump	3		0.4	Jump	---	5.0	mVdc
1201	Short and discontinuity detection	---		0.4	---	---	---	---
	Conformance inspection, part 2							
3278	Noise	---	Ebb/Ib = 3.5 mAdc	1.0	Eb	---	5.0	mVac
3347	Ionization voltage (2)	4		6.5	Ez	---	115	Vdc
3305	Leakage current	---	Eb = 50 Vdc; Rp = 3,000 ohms	6.5	LIb	---	5	µAdc
---	Voltage repeatability	5	Ebb/Ib = 2.5 mAdc	6.5	Etd	---	100	mVdc
1031	Low-frequency vibration	---	F = 40 Hz; 15 G; Rp = 10,000 ohms; Ebb/Ib = 2.5 mAdc	6.5	Ep	---	5.0	mVac
1041	Shock	---	450 G	---	---	---	---	---
1031	Vibration fatigue	6	2.5 G; fixed frequency; F = 25Hz (min), 60 Hz (max)	6.5	---	---	---	---
---	Post-shock and vibration fatigue test end points:							
3347	Ionization voltage (1)	---		---	Ez	---	115	Vdc
3337	Voltage drop (1)	---		---	Etd	82	90	Vdc
3337	Voltage drop (2)	---		---	Etd	82	90	Vdc
3335	Regulation	---		---	Reg	---	±3.0	Vdc
1121	Base strain	---		---	---	---	---	---
2126	Glass strain	---		2.5	---	---	---	---
1105	Permanence of marking	---		---	---	---	---	---

See notes at end of table.

TABLE I. Testing and inspection - Continued.

MIL-STD-1311 method	Requirement or test	Notes	Conditions	Acceptance Level 8/	Allowable defectives per characteristic		Symbol	Limits		Unit
					First sample	Combined samples		Min	Max	
	Conformance inspection, part 3									
1516	Stability life	---	Ebb/Ib = 2.5mA dc; TA = room	---	---	---	---	---	---	---
---	Stability life-test end point:	-								
---	Change in voltage drop (3) of individual tubes	---		2.5	---	---	ΔEtd t	---	200	mVdc
1521	Survival-rate life	---	Stability life-test conditions	---	---	---	---	---	---	---
---	Survival-rate-life test end points (100 hours):									
---	Inoperatives	---		---	---	---	---	---	---	---
---	Change in voltage drop (3) of individual tubes	---		2.5	---	---	ΔEtd t	---	500	mVdc
1501	Intermittent life	7	Stability life-test conditions, or equivalent; TA=150°C (min)	---	---	---	---	---	---	---
---	Intermittent life-test end points (500 hrs)									
---	Inoperatives	---		---	1	3	---	---	---	---
3335	Regulation	---		---	1	3	Reg	---	±3.0	Vdc
3337	Voltage drop (1)			---	1	3	Etd	82	90	Vdc
3337	Voltage drop (2)			---	1	3	Etd	82	87.5	Vdc
3337	Voltage drop (3)			---	1	3	Etd	82	88.5	Vdc
3347	Ionization voltage (1)			---	1	3	Ez	---	115	Vdc
---	Change in voltage drop (3) of individual tubes	---		---	1	3	ΔEtd t	---	1.5	Vdc
---	Total defectives	---		---	3	6	---	---	---	---
---	Intermittent life-test end points (1,000hrs)									
---	Inoperatives	---		---	2	5	---	---	---	---
3335	Regulation	---		---	2	5	Reg	---	±3.2	Vdc
3337	Voltage drop (1)	---		---	2	5	Etd	82	91	Vdc
3337	Voltage drop (2)	---		---	2	5	Etd	82	88	Vdc
3337	Voltage drop (3)	---		---	2	5	Etd	82	90	Vdc
3347	Ionization voltage (1)	---		---	2	5	Ez	---	115	Vdc
---	Total defectives	---		---	5	10	---	---	---	---

See notes at top of next page.

NOTES:

1. Internal connections, do not use.
2. See “Reduced pressure (altitude) rating”, and altitude, maximum peak voltage in the basic document.
3. Cycle (or vary) the tube current between 1.5 and 3.5 mA.
4. Conditions for this test shall be those of ionization voltage (1), except testing shall be done in total darkness, and the tube shall not have conducted or have been exposed to light for at least 24 hours prior to testing.
5. Repeatability shall be defined as the maximum shift in tube voltage drop between successive firings of the tubs. The tube shall be tested in the following manner:
   (a) The voltage drop shall be read at, 2.5 mAdc drain.
   (b) The tube shall be turned off for 1 minute.
   (c) The tube shall be restarted and operated at the same current.
   (d) The voltage drop shall be read after 1 minute of operation.
   (e) The “on-off” cycle shall be repeated a minimum of five times. The maximum difference in tube voltage drop shall be taken as the measure of repeatability.
6. This test shall be conducted on the initial lot and thereafter on a lot approximately every 6-months. When one lot has passed, the 6-month rule shall apply.
7. Envelope temperature (TE) requirements, when measured in accordance with the temperature by conduction-band measurement (method 1226), will be satisfied if a tube having bogey tube drop (Etd = ±3 percent) under normal test conditions, is determined to operate at minimum specified temperature at any position in the life-test rack.
8. This specification sheet utilizes accept on zero defect sampling plan in accordance with MIL-PRF-1, table III.

Referenced documents. In addition to MIL-PRF-1 this document references MIL-STD-1311.

Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army - CR
Navy - EC
Air Force - 85
DLA - CC

Preparing activity:
DLA-CC

(Project 5960-2008-067)

Review activities:
Army - AR
Navy - AS, CG, MC, OS, SH
Air Force - 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at http://assist.daps.dla.mil/.